

**Notice of Allowability**

Application No. <b>08/919,450</b>	Applicant(s) <b>Harrison</b>
Examiner <b>Cuong H. Nguyen</b>	Art Unit <b>3625</b>

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to the interview on 6/05/2003.
2.  The allowed claim(s) is/are 36-47; they are renumbered as claims 1-12.
3.  The drawings filed on \_\_\_\_\_ are acceptable as formal drawings.
4.  Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
  - a)  All
  - b)  Some\*      c)  None      of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \*Certified copies not received: \_\_\_\_\_.
5.  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
6.  Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7.  Applicant MUST submit NEW FORMAL DRAWINGS
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached 1)  hereto or 2)  to Paper No. 9.
  - (b)  including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the examiner.
  - (c)  including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8.  Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

**Attachment(s)**

1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____.
5 <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449), Paper No(s). _____	6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment
7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
9 <input type="checkbox"/> Other	

PTO-892 --- CONTINUATION SHEET ---

- H. Berliner and G. Goetsch, "A Study of Search Methods: The Effect of Constraint Satisfaction and Adventurousness," in Proceedings of the Ninth International Joint Conference on Artificial Intelligence, vol. 2, Aug. 18-23, 1985, pp. 11079 -11082.
- J.E. Collins and E.M. Sisley, "AI in Field Service: The Dispatch Advisor," in Working Notes, AI in Service and Support: Bridging the Gap Between Research and Applications, Eleventh National Conference on Artificial Intelligence, Washington, D.C., Jul. 11-15, 1993, pp. 26-37.
- T. Dean and M. Boddy, "An Analysis of Time-Dependent Planning," in Proceedings of the Seventh National Conference on Artificial Intelligence, A.A.A.I., 1988, pp. 49-54.
- M.S. Fox, N. Sadeh, and C. Baykan, "Constrained Heuristic Search," in Proceedings of the Eleventh International Joint Conference on Artificial Intelligence (IJCAI), Detroit, Michigan, vol. 1, Aug. 20-25, 1989, pp. 309-315.
- M.S. Fox, and S.F. Smith, "ISIS--A Knowledge-Based System for Factory Scheduling," Expert Systems, vol. 1, No. 1, 1984, pp. 25-49.
- E. Ghalichi and J. Collins, "The Dispatch Advisor," in Proceedings of the Workshop on Artificial Intelligence for Customer Service and Support, Eighth IEEE Conference on Artificial Intelligence Applications, Monterey, California, Mar. 3, 1992, pp. 60-68.
- D.L. Haugen, "A Study of Scheduling and Quality of Field-Service Support Systems," Ph.D. Thesis, University of Minnesota, Nov. 1993, pp. 1-251.

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- A.V. Hill, "An Experimental Comparison of Dispatching Rules for Field Service Support," *Decision Sciences*, vol. 23, No. 1, Winter 1992, pp. 235-249.
- A.V. Hill, "An Experimental Comparison of Human Schedulers and Heuristic Algorithms for the Traveling Salesman Problem," *Journal of Operations Management*, vol. 2, No. 4, Aug. 1982, pp. 215-233.
- A.V. Hill, V.A. Mabert, and D.W. Montgomery, "A Decision Support System for the Courier Vehicle Scheduling Problem," *OMEGA Int. J. of Mgmt. Sci.*, vol. 16, No. 4, 1988, pp. 333-345.
- A.V. Hill, J.D. Naumann, and N.L. Chervany, "SCAT and SPAT: Large-Scale Computer-Based Optimization Systems for the Personnel Assignment Problem," *Decision Sciences*, vol. 14, No. 2, Apr. 1983, pp. 207-220.
- A.V. Hill and D.C. Whybark, "Comparing Exact Solution Procedures for the Multi-Vehicle Routing Problem," *The Logistics and Transportation Review*, vol. 12, No. 3, 1976, pp. 145-153.
- A.V. Hill and D.C. Whybark, "Chexpedite: A Computer-Based Approach to the Bank Courier Problem," *Decision Sciences*, vol. 13, No. 2, Apr. 1982, pp. 251-265.
- R. Hublou, "Manufacturing Operations Scheduling," *Business Intelligence Program Report D90-1436*, SRI International, May 1990, pp. 1-39.
- B. Kalantari, A.V. Hill, and S.R. Arora, "An Algorithm for the Traveling Salesman Problem with Pickup and Delivery Customers", *European Journal of Operational Research*, vol. 22, No. 3, Dec. 1985, pp. 377-386.

- H. Prade, "Using Fuzzy Set Theory in a Scheduling Problem: A Case Study," *Fuzzy Sets and Systems*, vol. 2, No. 2, 1979, pp. 153-165.
- Fraternall, "A Knowledge Based Architecture for Incremental Scheduling", IEEE, May 1991, pp. 850-854.
- Collins et al., "Automated Assignment and Scheduling of Service Personnel", *IEEE Expert*, vol. 9, No. 2, Apr. 1994, pp. 33-39.
- Sycara et al., "Distributed Constrained Heuristic Search", *IEEE Transactions on Systems, Man and Cybernetics*, vol. 21, No. 6, Nov. 1991, pp. 1446-1461.
- P. Prosser, "A Reactive Scheduling Agent," in *Proceedings of the Eleventh International Joint Conference on Artificial Intelligence*, Detroit, Michigan, Aug. 20-25, 1989, pp. 1004-1009.
- S.F. Smith, "The OPIS Framework for Modeling Manufacturing Systems," *Tech Report CMU-RI-TR-89-30*, Carnegie-Mellon University, Dec. 1989, pp. 1-56.
- J. Tsitsiklis, "Special Cases of Traveling Salesman and Repairman Problems with Time Windows," *Report LIDS-P-1987*, Massachusetts Institute of Technology, Jun. 1990, pp. 1-23.
- W. Chiang, and M.S. Fox, "Protection Against Uncertainty in a Deterministic Schedule," in *Proceedings of the Fourth International Conference on Expert Systems in Production and Operations Management*, Hilton Head, South Carolina, May 1990, pp. 184-196.
- D. Whitley, T. Starkweather, and D. Shaner, "The Traveling Salesman and Sequence Scheduling: Quality Solutions Using Genetic Edge Recombination," *Handbook of Genetic Algorithms*, Chapter 22, 1991, pp. 350-372.

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- M. Zweben, "Constraint-Based Simulated Annealing: An Iterative Improvement Framework for Constraint Satisfaction Search," NASA Ames Research Center, Moffett Field, California, Aug. 9, 1990, pp. 1-13.
- M. Zweben, M. Deale, and R. Gargan, "Anytime Rescheduling," in Proceedings of a Workshop on Innovative Approaches to Planning, Scheduling and Control, San Diego, California, Nov. 5-8, 1990, pp. 251-259.

## DETAILED ACTION

1. This Office Action is the answer to the "SUBSTITUTE RESPONSE TO OFFICE ACTION" received on 4/16/2003, and the interview with Mr. Gary R. Jarosik (applicant's representative) on 6/05/2003, which papers have been placed of records in the file.

### **Examiner 's amendment:**

2. The authorization for this amendment was given by Mr. Gary R. Jarosik (register # 35,906) on 6/05/2003. Should the changes be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

- In Claim 36, line 1: Insert between "of" and "service" with -- unassigned --.
- In claim 36, line 7: substitute "request," with — request; means for considering --.
- In claim 42, line 1: Insert between "of" and "service" with -- unassigned --.
- In claim 42, line 5: Insert between "technician," and "a" with -- considering --.
- In claim 42, line 6: Insert between "request," and "prior" with — considering --.

### **Allowable Subject Matter & Reasons for Allowance**

3. Independent claim 36 is patentable distinct over the closest references of **Sisley et al.** (US Pat. 5,737,728), **Oba** (US Pat. 5,241,465), **Sobotka et al.** (US Pat. 5,197,004) because these references do not anticipate nor fairly and reasonably teach a system for handling a plurality of unassigned service requests, comprising:

- means for using programming to process the plurality of unassigned service requests for the purpose of assigning to each of the plurality of

unassigned service requests one or more of a plurality of technicians as a function of at least a skill level of each of the plurality of technicians, a skill level required by each of the plurality of unassigned service requests; means for considering prior service requests assigned top each of the plurality of technicians via the programming, and an amount of time to complete each of the plurality of unassigned service requests..

4. Independent claim **42** is patentable distinct over the closest references of **Sisley et al.** (US Pat. 5,737,728), **Oba** (US Pat. 5,241,465), **Sobotka et al.** (US Pat. 5,197,004) because these references do not anticipate nor fairly and reasonably teach a method for handling a plurality of unassigned service requests, comprising:

- using programming for the purpose of assigning to each of the plurality of unassigned service requests one or more of a plurality of technicians as a function of at least a skill level of each of the plurality of technician; considering a skill level required by each of the plurality of unassigned service requests, considering prior service requests assigned to each of the plurality of technicians via the programming, and an amount of time to complete each of the plurality of unassigned service requests.

5. Claims **37-41**, and **43-47** are allowed because they are dependent upon claims 36, and 42 (in that order).

6. In summary, **Sisley et al.**, **Oba**, **Sobotka et al.**, only consider the impact of a single service request on an existing call set rather than disclosing a system having programming designed to assign technicians to a plurality of unassigned service requests; **Sisley et al.** disclose a system that is designed only to explore the effects of an incremental change to a set of service requests already assigned to technicians. **Sisley et al.** do not teach of attempting to assign technician to a plurality of unassigned service request, considering prior service

requests assigned to each of the plurality of technicians via the programming; and considering an amount of time to complete each of the plurality of unassigned service requests.

***Conclusion***

7. Claims 36-47 are patentable. They are renumbered as claims 1-12.
8. These following references are related to this invention however, they don't suggest that above reason for allowance of the pending invention:
  - Sisley et al., (US Pat.5,943,652 – 8/24/1999, 705/9), titled "Resource assignment and scheduling system".
  - Sisley et al., (US Pat.5,737,728 – 4/07/1998, 705/9), titled "System for Resource assignment and scheduling".
  - Sisley et al., (US Pat.5,467,268 – 11/14/1995, 705/9), titled "Method for resource assignment and scheduling".
  - H. Berliner and G. Goetsch, "A Study of Search Methods: The Effect of Constraint Satisfaction and Adventurousness," in Proceedings of the Ninth International Joint Conference on Artificial Intelligence, vol. 2, Aug. 18-23, 1985, pp. 11079 -11082.
  - J.E. Collins and E.M. Sisley, "AI in Field Service: The Dispatch Advisor," in Working Notes, AI in Service and Support: Bridging the Gap Between Research and Applications, Eleventh National Conference on Artificial Intelligence, Washington, D.C., Jul. 11-15, 1993, pp. 26-37.

- T. Dean and M. Boddy, "An Analysis of Time-Dependent Planning," in *Proceedings of the Seventh National Conference on Artificial Intelligence*, A.A.I., 1988, pp. 49-54.
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- M.S. Fox, and S.F. Smith, "ISIS--A Knowledge-Based System for Factory Scheduling," *Expert Systems*, vol. 1, No. 1, 1984, pp. 25-49.
- E. Ghalichi and J. Collins, "The Dispatch Advisor," in *Proceedings of the Workshop on Artificial Intelligence for Customer Service and Support*, Eighth IEEE Conference on Artificial Intelligence Applications, Monterey, California, Mar. 3, 1992, pp. 60-68.
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- A.V. Hill and D.C. Whybark, "Comparing Exact Solution Procedures for the Multi-Vehicle Routing Problem," *The Logistics and Transportation Review*, vol. 12, No. 3, 1976, pp. 145-153.
- A.V. Hill and D.C. Whybark, "Chexpedite: A Computer-Based Approach to the Bank Courier Problem," *Decision Sciences*, vol. 13, No. 2, Apr. 1982, pp. 251-265.
- R. Hublou, "Manufacturing Operations Scheduling," *Business Intelligence Program Report D90-1436*, SRI International, May 1990, pp. 1-39.
- B. Kalantari, A.V. Hill, and S.R. Arora, "An Algorithm for the Traveling Salesman Problem with Pickup and Delivery Customers", *European Journal of Operational Research*, vol. 22, No. 3, Dec. 1985, pp. 377-386.
- H. Prade, "Using Fuzzy Set Theory in a Scheduling Problem: A Case Study," *Fuzzy Sets and Systems*, vol. 2, No. 2, 1979, pp. 153-165.
- Fraternall, "A Knowledge Based Architecture for Incremental Scheduling", *IEEE*, May 1991, pp. 850-854.
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- Sycara et al., "Distributed Constrained Heuristic Search", *IEEE Transactions on Systems, Man and Cybernetics*, vol. 21, No. 6, Nov. 1991, pp. 1446-1461.

- P. Prosser, "A Reactive Scheduling Agent," in Proceedings of the Eleventh International Joint Conference on Artificial Intelligence, Detroit, Michigan, Aug. 20-25, 1989, pp. 1004-1009.
- S.F. Smith, "The OPIS Framework for Modeling Manufacturing Systems," Tech Report CMU-RI-TR-89-30, Carnegie-Mellon University, Dec. 1989, pp. 1-56.
- J. Tsitsiklis, "Special Cases of Traveling Salesman and Repairman Problems with Time Windows," Report LIDS-P-1987, Massachusetts Institute of Technology, Jun. 1990, pp. 1-23.
- W. Chiang, and M.S. Fox, "Protection Against Uncertainty in a Deterministic Schedule," in Proceedings of the Fourth International Conference on Expert Systems in Production and Operations Management, Hilton Head, South Carolina, May 1990, pp. 184-196.
- D. Whitley, T. Starkweather, and D. Shaner, "The Traveling Salesman and Sequence Scheduling: Quality Solutions Using Genetic Edge Recombination," Handbook of Genetic Algorithms, Chapter 22, 1991, pp. 350-372.
- M. Zweben, "Constraint-Based Simulated Annealing: An Iterative Improvement Framework for Constraint Satisfaction Search," NASA Ames Research Center, Moffett Field, California, Aug. 9, 1990, pp. 1-13.
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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Cuong H. Nguyen, whose

telephone number is (703)305-4553. The examiner can normally be reached on Monday-Friday from 7:15 AM-3:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Wynn Coggins, can be reached on (703)308-1344.

**Any response to this action should be mailed to:**

Issue

***Commissioner of Patents and Trademarks  
Washington D.C. 20231***

or faxed to:

(703)305-7687 [Official communications; including  
After Final communications labeled "Box AF"]

703-746-5572 (RightFax) Informal/Draft communications, labeled "PROPOSED" or  
"DRAFT"]

Hand delivered responses should be brought to Crystal Park 5, 2451 Crystal Drive,  
Arlington, VA, 7<sup>th</sup> floor receptionist.

Any inquiry of a general nature or relating to the status of this application or  
proceeding should be directed to the Receptionist whose telephone number is  
(703)308-1113.

*Cuonghnguyen*  
Primary Examiner  
June 13, 2003